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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,804	02/20/2004	Young-Hun Joo	5000-1-526	7185

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EXAMINER	
LEUNG, WAI LUN	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/783,804	JOO ET AL.	
	Examiner	Art Unit	
	Wai Lun Leung	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/21/2007 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Furthermore, the key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in *KSR International Co. v. Teleflex Inc.* note that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Court quoting *In re Kahn* 441 F.3d977,988,78 USPQ2d1329,1336(Fed.Cir.2006) stated that "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."

3. Claims 1-5, and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Farmer** *(US007146104B2)*, in view of **Bohn et al.** *(US005311344A)*, and further in view of **Spurgeon** *(Ethernet: The Definitive Guide, chapters 9 & 10)*.

Regarding claim 1, **Farmer** discloses an optical subscriber network system *(fig 7)*, comprising: a server bi-directional optical transmitter *(fig 7, data server both sends and receives optical signals over optical waveguide 150)* and a subscriber bi-directional optical receiver *(fig 7, subscriber in the home both sends and receives optical signals over optical waveguide 150)*. **Farmer** does not disclose expressly the details within the server and the subscriber.

Bohn, from the same field of endeavor, teaches an optical subscriber network system *(fig 1)* comprising:

a server bi-directional optical transmitter *(2, fig 1)* including

a multiplexer *(22, fig 1)* for multiplexing communication data and broadcast data *(col 3, ln 12-23)*,

a server laser diode *(23, fig 1)* for converting the multiplexed data into an optical signal *(col 3, ln 16-23)* for downstream transmission to a subscriber *(fig 1, subscriber terminal 51, 52, 53, or 54)* , and

a server photo diode *(24, fig 1)* for receiving an converting optical signals comprising communication data from a subscriber *(5_1, fig 1)*, wherein the server bi-directional optical transmitter transmits the upstream communication data *(col 2, ln 47-49 defined inbound service as upstream traffic; col 3, ln 57-61 described the discriminator 28 in the headend output this inbound service, which is an upstream traffic)*; and

a subscriber bi-directional optical receiver *(subscriber terminal 5_1, fig 1; also shown in fig 2)* including

a subscriber laser diode *(55, fig 2)* for transmitting upstream communication data *(col 4, ln 33-35)*,

a subscriber photo diode *(photodetector 52, fig 2)* for receiving and converting the optical signal transmitted from the server bi-directional optical transmitter into an electrical signal *(col 4, ln 19-25)*, and

a demultiplexer *(54, fig 2)* for multiplexing and dividing the multiplexed signal into communication data and broadcast data *(col 4, ln 28-32)*.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to implement **Farmer**'s system using **Bohn's** server bi-direction optical transmitter and subscriber bi-directional optical receiver. The motivation for doing so would have been to enable bi-directional non-interfering transmission of broad-band services on a single fiber as suggested by **Bohn**.

Farmer further teaches wherein the optical transmitter and optical receiver are configured for transceiving image signals and Ethernet communication signals in two directions *(fig 7, SOI unit 140 converts optical signal from optical waveguide 150 to television image signal to coax cable 509, as well as Data Packets thru data cable) (col 6, ln 63-col 8, ln 55)*. Although the **combination of Farmer and Bohn** does not disclose expressly wherein the optical transmitter and optical receiver are configured for transceiving image signals and Ethernet communication signals in two directions by a single laser diode and photodiode. **Farmer** further teaches the actual number of subscriber optical interfaces is dependent upon the amount of power

available on a particular optical fiber *(col 9, ln 58-col 10, ln 26)* . Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to recognize that the number of laser diode and photodiode being used is an obvious engineering design choice dependent upon the amount of power available on a particular optical fiber as suggested by **Farmer**. With a finding that at the time of the invention, that the scope and content of the prior art, whether in the same of different field of endeavor as that of the applicant's invention or a different field of endeavor, included a similar or analogous device ***(Farmer's and Bohn's)***; a finding that there were design incentives or market forces which would have prompted adaptation of the known device ***(Farmer, (col 9, ln 58-col 10, ln 26))***; a finding that the differences between the claimed invention and the prior art were encompassed in known variations or in a principle known in the prior art; and a finding that one of ordinary skill in the art, in view of the design incentives or market forces, could have implemented the claimed variation of the prior art, and the claimed variation would have been predictable ***(Farmer, (col 10, ln 5-55))***. Therefore, the rational to support a conclusion that the claim would have been obvious has been clearly articulated in that design incentives or other market forces could have prompted one of ordinary skill in the art to vary the prior art in a predictable manner to result in the claimed inventions. In *KSR*, 550 U.S. 82 USPQ 2d at 1385.

The combination of Farmer and Bohn does not disclose expressly wherein the server bi-directional optical transmitter includes a first PHY device to convert the communication data received from the server photo diode into a media independent interface type (MII) signal; and an Ethernet switch coupled to the first PHY device, the multiplexer and a second PHY device. **Spurgeon**, from the same field of endeavor, teaches a common and well known method of

configuring a server using a first PHY device to convert the communication data received from a photo diode into a media independent interface type (MII) signal *(section 10.1.3; fig 10-2)*; and an Ethernet switch coupled to the first PHY device, the multiplexer and a second PHY device *(fig 10-4; section 10.3)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to configure **the combination of Farmer and Bohn**'s system using PHY devices and Ethernet switch as suggested by **Spurgeon**. The motivation for doing so would have been to enable faster communication speed by performing optical communication while complying with the ANSI x3T9.5 FDDI standard *(Spurgeon, section 10.1.4)*.

As to claim 2, **Bohn** further teaches wherein the multiplexer and demultiplexer comprise time division multiplexer (TDM) and demultiplexer (TDDM), respectively *(col 3, ln 13-14;col 4, ln 28-30)*.

As to claims 3 and 4, **Farmer** further teaches wherein the communication data is received from a server computer *(608, fig 7; col 22, ln 41-49), and* wherein the server bi-directional optical transmitter transmits the upstream communication data to the server computer *(col 22, ln 41-46)*.

As to claim 5, **Bohn** further teaches wherein the subscriber bi-directional optical receiver providing the communication data divided by a TDDM *(col 4, ln 28-30)*, **Bohn** does not disclose expressly having a subscriber-side computer. **Farmer,** from the same field of endeavor, teaches a subscriber bi-directional optical receiver providing communication data to a subscriber-side computer, and the data can be received at various time *(col 28, ln 40-53)*.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to provide communication data to a subscriber-side computer using **Bohn**'s

subscriber bi-directional optical receiver providing the communication data divided by a TDDM, as suggested by **Farmer**. The motivation for doing so would have been to be able to utilize data transmitted via digital contention network protocols such as Ethernet formatted packets by using a subscriber-side computer *(Farmer, col 3, ln 13-20)*.

Regarding claim 8, **the combination of Bohn, Farmer, and Spurgeon** discloses the system in accordance to claim 5 as discussed above. **Farmer** further teaches wherein the subscriber bi-directional optical receiver comprises: an Ethernet switch *(568A, fig 7)* to (1) switch the communication data to a subscriber-side computer *(fig 7, 572A)*, and (2) receive the communication data from the subscriber computer *(col 18, ln 36-50)*; and a third PHY device *(fig 7, 568B)* coupled to the demultiplexer, wherein a TX signal from the Ethernet switch is used to operate the third PHY device *(fig 7 illustrates Upstream/Downstream Ethernet Data is being sent to the third PHY device 568B)*. **Spurgeon** further teaches a type of PHY device being used to convert the communication data with a MII type into a TX signal for the Ethernet switch, and convert a MII signal from the Ethernet switch into a TX signal for the subscriber laser diode *(fig 10-2; section 10.1.3)*. Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to combine the teachings of **Bohn, Farmer, and Spurgeon** for the same reasons as stated above.

As to claim 9, **Spurgeon** further teaches a first PHY device converts a 100 Base-T optical fiber signal into a MII signal *(fig 9-2; section 9.1.3)*, and the second PHY device converts a media independent interface (MII) signal into a multi level transmit-3 (MLT-3) signal *(section 9.1.4.1)*.

As to claim 10, **Bohn** further teaches wherein the TDM inserts a plurality of broadcast data streams and communication data into time slots and generates time slot frames *(col 4, ln 19-22)*.

As to claim 11, **Spurgeon** further teaches wherein subscriber bi-directional optical receiver further comprising:

a third PHY device to converting a media independent interface (MII) signal input from an Ethernet switch into a Fast Ethernet (FX) signal and output the FX signal to the subscriber laser diode *(fig 10-2; section 10.1.3)*.

As to claim 12, **Spurgeon** further teaches wherein the FX signal is a non return to zero inversion (NRZI) signal *(section 10.1.4.1)*.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Farmer** *(US007146104B2)*, in view of **Spurgeon** *(Ethernet: The Definitive Guide, chapters 9 & 10)*.

Regarding claim 6, **Farmer** teaches an optical subscriber network system *(fig 7)* comprising:

a subscriber bi-directional optical receiver including an Ethernet switch *(fig 7, 140)*, a first PHY device *(fig 7, 117)*, a second PHY device *(fig 7, 566B)*, and a third PHY device *(fig 7, 568B)*, wherein, the TX signal output from the second PHY device is used to operate the first PHY device *(fig 7, packets 606 sent from PHY device 566B is used to control PHY device 117)*;

a subscriber photo diode to for receiving and converting the optical signal transmitted from the computer server into an electrical signal, and wherein the optical receiver is configured for receiving image signals and Ethernet communication signals *(fig 7, 140 convert signal from*

optical waveguide 150 to image signal and sent it through coax 509, and ethernet data packets over data cable). Although **Farmer** does not expressly teaches to perform such converting function by a single photo diode, **Farmer** further teaches the actual number of subscriber optical interfaces is dependent upon the amount of power available on a particular optical fiber *(col 9, ln 58-col 10, ln 26)* . Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to recognize that the number of laser diode and photodiode being used is an obvious engineering design choice dependent upon the amount of power available on a particular optical fiber as suggested by **Farmer**, and the result would have been predictable for the same reasons as stated above.

Farmer does not disclose expressly teaches the specifics of the PHY devices. **Spurgeon**, from the same field of endeavor, teaches:

an Ethernet switch configured to (1) switch the communication data transmitted from a demultiplexer to a subscriber computer, and (2) receive the communication data transmitted from the subscriber computer *(fig 10-4; section 10.3)*;

a first PHY device coupled to the demultiplexer to convert the communication data with a media independent interface type (MII type) into a TX signal *(fig 9-2; section 9.1.3)*;

a second PHY device to convert the TX signal into a MII signal for the Ethernet switch, and to convert a MII signal from the Ethernet switch into a TX signal to the subscriber laser diode *(fig 10-2; section 10.1.3)*; and

a third PHY device for converting the MII signal into a multi level transmit-3 (MLT-3) signal *(section 9.1.4.1 teaches MLT-3 signaling)*.

Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to apply **Spurgeon's** teachings of PHY devices and Ethernet switch onto **Farmer**'s system as suggested by **Spurgeon**. The motivation for doing so would have been to enable faster communication using a 100BASE-FX media system over popular Ethernet backbone networks *(Spurgeon, chapter 10)*.

Response to Arguments

5. Applicant's arguments with respect to claims 1-12 have been considered but are not persuasive.

Applicant argues that Farmer discloses a plurality of "transmitters" (plural) and a plurality of lasers in *(col 11, ln 21-28)* ; however, Farmer teaches the actual number of subscriber optical interfaces is dependent upon the amount of power available on a particular optical fiber *(col 9, ln 58-col 10, ln 26)* . Therefore, it would have been obvious for a person of ordinary skill in the art at the time of invention to recognize that the number of laser diode and photodiode being used is an obvious engineering design choice dependent upon the amount of power available on a particular optical fiber as suggested by **Farmer**. Farmer also explicitly illustrates broadcast data and communication data in *(fig 7)*. Therefore, the combined teachings of Farmer, Bohn, and Spurgeon suggests that design incentives or other market forces could have prompted one of ordinary skill in the art to vary the prior art in a predictable manner to result in the claimed inventions. In *KSR*, 550 U.S. 82 USPQ 2d at 1385.

Conclusion

6. The prior art made of record herein and in previous office action(s) and not relied upon is considered pertinent to applicant's disclosure.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai Lun Leung whose telephone number is (571) 272-5504. The examiner can normally be reached on 11:30am-9:00pm Mon-Thur.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DWL
December 5, 2007

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